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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Tatsuya Ikeda

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EXAMINER

OLSEN, LIN B

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/595,226	Applicant(s) IKEDA ET AL.	
	Examiner LIN B. OLSEN	Art Unit 3661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on December 22, 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 March 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement (IDS) submitted on February 19, 2009 was filed after the mailing date of the first action on the merits. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Response to Amendment

The amendments to the specification have been reviewed and it has been confirmed that no new matter has been added. The Examiner appreciates the effort that went into these amendments. The substitute specification has been entered.

The objections to claims **1, 3-4 and 6** have been overcome by amendment. The Objections are withdrawn.

The rejections of claims **1, 2 and 4** under 35USC 112 1st or 2nd paragraphs have been overcome by amendment. The rejection of these claims is withdrawn.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims **1-5, 7-13 and 15** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,570,609 to Nihei et al. (Nihei) in view of EP 1 085 389 to Terada et al (Terada). Nihei is concerned with an articulated industrial robot with

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a reference setting capability. Terada is concerned with a controller for an industrial robot that interacts with an operator to calibrate the machine.

Independent claims 1 and 9 are related as methods of adjusting the origin of industrial robots where one incorporates an accommodation hole and is proactive about operator interactions and the other (9) does not incorporate an accommodation hole and does not explicitly double check operator actions. Comparable claims will be addressed simultaneously.

Regarding independent **claims 1 and 9**, “A method of adjusting an origin of an industrial robot, said method comprising:

providing an industrial robot which includes

a first member having an accommodation hole,

a positioning member attached to the first member and being positionable in the accommodation hole,

a second member being rotatable relative to the first member, the second member having a contact point being operable to contact the positioning member,

a first joint for coupling the first member with the second member;

wherein said positioning member has a first position in which said positioning member protrudes from said first member such that said positioning member is operable to contact the contact point and a second position in which said positioning member is disposed in the accommodation hole and is not operable to contact the contact point;” – in Nihei, Figure 1, the industrial robot is shown with a number of

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members; reference number 12 associated with first member, reference number 14 associated with second member, rotatable relative to the first member. As shown in Fig. 1, positioning member 24 fits into threaded hole 26 of item 12 and can contact contact point 22 of item 14. Nihei col. 5, lines 1-12 describes the twisting relationship (Joint) between items 12 and 14. Nihei does not show an accommodation hole for the positioning member, but it would have been obvious to one of ordinary skill in the art at the time of the invention that a storage location is needed for a positioning member that is removable and would be needed repeatedly. It would be obvious to try an accommodation hole as one of a finite number of alternatives that could be identified, each a predictable solution with a reasonable expectation of keeping a needed part available for utilization. Further, since Nihei suggests that the reference mechanism could be incorporated in multiple joints of an industrial robot, it would be obvious to provide an accommodation hole to secure a single positioning pin that could be used to calibrate any of the joints.

“displaying a first indication to place the positioning member in the first position;

“after said displaying the first indication, placing the positioning member in the first position;

after said placing the positioning member in the first position, rotating the second member at the first joint relative to the first member while the positioning member is in the first position;

during said rotating the second member, detecting whether or not the contact point of the second member is in contact with the positioning member;” – The procedure

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to set the reference position is described in Nihei col. 5 lines 28-48 and includes placing the positioning member 24 in the attaching hole (Position 1); when the protrusion 22 on the robot forearm 14 is rotated so that it contacts the positioning pin, the forearm is at the reference position. The procedure described in Nihei, while assuming computer controls, does not mention prompting an operator to do their part. However, Terada is cited because it shows a calibration procedure that is implemented with prompting to the operator via the display 13 of Fig. 1. Although Terada is specifically concerned with a robot controlled injection molding machine, an industrial machine, in Terada Fig. 26a, an automated calibration flow chart is shown including displaying directions to an operator and proceeding based on the actions being accomplished. Further in paragraphs [0021-0026] Terada details calibration processing including displaying instructions to the operator and interpreting inputs from the operator as indicating that an action has been carried out. It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the prior art technique of reminding the operator of the steps of a calibration procedure in order to synchronize the machine and operator as taught by Terada to the procedure taught by Nihei to yield predictable results.

“storing a position of the second member as the origin when the contact point of the second member is in contact with the positioning member;” – In col. 6, lines 1-10, Nihei discusses the application of the use of the reference point when replacing motors, and details that after the reference point is reached, the position data of the robot

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forearm 14 at the reference point is recorded in the position detector of the installed drive motor by the robot controller.

“after storing the position of the second member, positioning the contact point at a predetermined position where the contact point does not contact the positioning member;

displaying a second indication to place the positioning member in the second position;

after said displaying said second indication, placing the positioning member in the second position.” – In col. 6 line 64 to col. 7 line 2, Nihei describes removing the positioning member if it is within the range of stroke of the robot forearm, once the single-axis calibration is done.

Regarding **claims 2 and 10**, which are dependent on claims 1 and 9 respectively, further comprising:

“confirming whether or not the positioning member cannot contact the contact point.” - In Nihei, the positioning pin 24 is removed from element 12 after the twist arm 14 is moved out of the way. It would have been obvious to one of ordinary skill in the art at the time of the invention to prompt the operator to remove the positioning pin in the Nihei/Terada system and then confirm that the arm 14 can move to any position.

Regarding **claims 3 and 11**, which are dependent on claims 2 and 10 respectively, “wherein said confirming whether or not the positioning member cannot

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contact the contact point comprises rotating the second member at the first joint relative to the first member.” – In Nihei, when the process of replacing a motor part is described at col. 5 lines 51-66, after the reference position is noted, the forearm is moved to a position where the defective part can be replaced.

Regarding **claims 4 and 12**, which are dependent on claims 1 and 9 respectively,

“wherein said displaying the second indication to place the positioning member in the second position is executed before said positioning the contact point of the second member at the predetermined position.” - It would have been obvious to one of ordinary skill in the art at the time of the invention to prompt the operator to remove the positioning pin in the Nihei/Terada system and then confirm that the arm 14 can move to any position.

Regarding **claims 5 and 13**, which are dependent on claims 1 and 9 respectively, “wherein the industrial robot further includes a second joint, said method further comprising selecting the first joint from the first joint and the second joint.” – Nihei col. 6 lines 43-56 suggests that other joints of the multi-articulated industrial robot can be similarly calibrated. It would have been obvious to use the same procedure with a substitution of joint nomenclature to perform this operation.

Regarding **claim 7-8 and 15**, which are dependent on claims 1 and 9 respectively, “wherein in said second position said positioning member is disposed entirely within said accommodation hole and wherein placing the positioning member in the second position comprises disposing said positioning member entirely within said accommodation hole.” – While Nihei does not show an accommodation hole explicitly, it would have been obvious to one of ordinary skill in the art at the time of the invention that a storage location is needed for a positioning member that is removable and would be needed repeatedly, especially when Nihei suggests that the reference mechanism could be incorporated in multiple joints of an industrial robot. It would be obvious to try an accommodation hole as one of a finite number of alternatives that could be identified, (positioning member on a tether, positioning member hook provided, accommodation hole) each with a reasonable expectation of keeping a needed part available for utilization. Should the accommodation hole be placed in the throw of the joint, then the disposed positioning member would need to be flush with the surface, hence entirely within the accommodation member.

Claims **6 and 14 are** rejected under 35 U.S.C. 103(a) as being unpatentable over Nihei/Terada as applied to claims 1 and 9 respectively above, and further in view of U.S. Patent No. 6,996,456 to Cordell et al. (Cordell). Cordell is concerned with calibrating an industrial robot

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Regarding **claims 6 and 14**, which are dependent on claims 1 and 9 respectively, “wherein the first joint of the industrial robot further includes a motor for rotating the second member relative to the first member, and

wherein said detecting whether or not the contact point of the second member is in contact with the positioning member comprises detecting a current flowing in the motor.” – Nihei shows a motorized joint connecting elements 12 and 14. Nihei does not specify the means to identify contact of the positioning pin and the contact surface, but Cordell at col. 3 lines 1-4 indicates that touch sensing may be accomplished by sensing the motor torque variations. It would have been obvious to one of ordinary skill in the art at the time of the invention to use Cordell’s touch sensing in the Nihei/Terada combination according to known methods since it does not require further costs as a switch or current flow sensor would and is more precise than a visual measurement.

Response to Arguments

Applicant's arguments with respect to claims 1-6 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LIN B. OLSEN whose telephone number is (571)272-9754. The examiner can normally be reached on Mon - Fri, 8:30 -5.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas G. Black can be reached on 571-272-6956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lin B Olsen/
Examiner, Art Unit 3661

/Thomas G. Black/
Supervisory Patent Examiner, Art Unit 3661